CLAIMS

What is claimed is:

1. An apparatus comprising:

one or more light source assemblies; and

a positioning means for positioning the one or more light source assemblies within a rotating reference frame of a wheel, such that an amount of light from the light source assemblies reflected from a surface of the wheel is greater than an amount of light from the light source assemblies directed away from the surface of the wheel.

2. The apparatus of claim 1 wherein the one or more light source assemblies are light sources selected from the group consisting of light-emitting diodes, filament-based light elements, gas-based light elements, lasers, and a combination thereof.

3. The apparatus of claim 1 wherein the light source assemblies are positioned on a portion of the wheel selected from the group consisting of a wheel rim, a rim flange, a wheel center cap, a disk, a hat, a spoke, and a combination thereof.

4. The apparatus of claim 3 wherein surface of the wheel from which the light is reflected includes the surface of a structural element attached to the wheel.

5. The apparatus of claim 3 wherein surface of the wheel from which the light is reflected includes the surface of a coating applied to the wheel.

6. The apparatus of claim 4 wherein the structural element attached to the wheel is a hubcap.

7. The apparatus of claim 1 wherein the light source assemblies are positioned on a structural element attached to the wheel.

8. The apparatus of claim 7 wherein the structural element attached to the wheel is a hubcap.

9. The apparatus of claim 1 wherein at least one of the light source assemblies includes a shield attached thereto such that the amount of light from the at least one light source assemblies directed away from the surface of the wheel, that is incident in a specified observation region, is reduced.

10. The apparatus of claim 9 wherein at least one of the shields has a reflective surface facing a light source of the attached light source assembly such that a portion of a light reflected from the reflective surface is incident upon the wheel surface.

11. The apparatus of claim 1 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more light projectors.

12. The apparatus of claim 1 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more optical elements.

13. The apparatus of claim 1 wherein the light source assemblies are positioned on a structure attached to at least a portion of a rim of the wheel.

14. The apparatus of claim 13 wherein the structure is an annular ring attached to a rim flange of the wheel.

15. The apparatus of claim 11 wherein the light source assemblies are positioned on a wheel center cap affixed to the wheel.

16. The apparatus of claim 12 wherein the light source assemblies are positioned on a crossbeam member.

17. The apparatus of claim 16 wherein the crossbeam member extends across a diameter of a rim of the wheel.

18. The apparatus of claim 1 wherein the light source assemblies are positioned within a portion of the wheel.

19. The apparatus of claim 1 wherein a portion of light from at least one of the light source assemblies is coupled to a corresponding waveguide, each corresponding waveguide directing the coupled portion of light to the surface of the wheel.

20. The apparatus of claim 19 wherein the portion of the light is directed to the surface of the wheel through a micro-optic prism array sheet collimator layer.

21. The apparatus of claim 1 further comprising:

one or more additional light source assemblies such that an amount of light from the additional light source assemblies directed away from the surface of the wheel is greater than an amount of light reflected from the surface of the wheel.

22. The apparatus of claim 21 wherein the one or more additional light source assemblies is operated independently of the one or more light source assemblies.

23. An assembly comprising:

a wheel; and

a wheel illuminator having one or more light source assemblies positioned within a rotating reference frame of the wheel, such that a sufficient amount of light from the light source assemblies is directed toward a surface of the wheel so that an amount of light reflected from the surface of the wheel is greater than an amount of light from the light source assemblies directed away from the surface of the wheel.

24. The assembly of claim 23 wherein the light source assemblies are light sources selected from the group consisting of light-emitting diodes, filament-based light elements, gas-based light elements, lasers, and a combination thereof.

25. The assembly of claim 23 wherein the wheel illuminator is positioned on a portion of the wheel selected from the group consisting of a wheel rim, a rim flange, a wheel center cap, a disk, a hat, a spoke, and a combination thereof.

26. The assembly of claim 23 wherein at least one of the light source assemblies is shielded such that the amount of light from the light source assemblies directed away from the surface of the wheel, that is incident in a specified observation region, is reduced.

27. The assembly of claim 26 wherein at least one of the light source assemblies includes a shield attached thereto, each shield having a reflective surface facing a light source of the attached light source assembly such that a portion of the light reflected from the reflective surface is incident upon the wheel surface.

28. The assembly of claim 23 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more light projectors.

29. The assembly of claim 23 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more optical elements.

30. The assembly of claim 23 wherein the wheel illuminator includes an annular ring attached to a portion of a rim of the wheel, the light source assemblies positioned within the ring.

31. The assembly of claim 30 wherein the wheel illuminator comprises a wheel center cap affixed to the wheel having the light source assemblies positioned therein.

32. The assembly of claim 29 wherein the wheel illuminator comprises one or more crossbeam members, the light source assemblies positioned upon the one or more crossbeam members.

33. The assembly of claim 31 wherein each of the one or more crossbeam members extend across a diameter of a rim of the wheel.

34. The assembly of claim 23 wherein the wheel illuminator is incorporated into a structure of the wheel.

35. The assembly of claim 23 wherein at least one of the light source assemblies includes a waveguide such that a portion of light from the at least one of the light source assemblies is coupled to the waveguide and directed from the waveguide to the surface of the wheel.

36. A method comprising:

determining a position for mounting one or more light source assemblies within a rotating reference frame of a wheel, such that an amount of light from the light source assemblies,

incident upon a surface of the wheel, results in the reflection of an amount of light from the surface of the wheel that is greater than an amount of light from the light source assemblies directed away from the surface of the wheel; and

mounting the light source assemblies in the determined position.

37. The method of claim 36 wherein the light source assemblies are light sources selected from the group consisting of light-emitting diodes, filament-based light elements, gas-based light elements, lasers, and a combination thereof.

38. The method of claim 36 wherein the light source assemblies are mounted on a portion of the wheel selected from the group consisting of a wheel rim, a rim flange, a wheel hub, a spoke, and a combination thereof.

39. The method of claim 36 wherein at least one of the light source assemblies is shielded such that the amount of light from the light sources directed away from the surface of the wheel, that is incident in a specified observation region, is reduced.

40. The method of claim 39 wherein at least one of the light source assemblies includes a corresponding shield attached thereto, at least one of the shields having a reflective surface facing a light source of the attached light source assembly such that a portion of a light reflected from the reflective surface is incident upon the wheel surface.

41. The method of claim 36 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more light projectors.

42. The method of claim 36 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more optical elements.

43. The method of claim 36 wherein the light source assemblies are mounted on a structure attached to at least a portion of a rim of the wheel.

44. The method of claim 43 wherein the structure is an annular ring attached to a rim flange of the wheel.

45. The method of claim 41 wherein the light source assemblies are mounted on a wheel center cap affixed to the wheel.

46. The method of claim 42 wherein the light source assemblies are mounted on a crossbeam member.

47. The method of claim 46 wherein the crossbeam member extends across a diameter of a rim of the wheel.

48. The method of claim 36 wherein at least one of the light source assemblies includes a waveguide such that a portion of light from the at least one of the light source assemblies is coupled to the waveguide and directed from the waveguide to the surface of the wheel.

49. The method of claim 48 wherein the waveguide is a micro-optic prism array sheet collimator layer.

50. The method of claim 36 wherein the light source assemblies are discrete assemblies.

51. A system comprising:

one or more mountable light source assemblies; and

instructions for mounting the light source assemblies within a rotating reference frame of a wheel, such that an amount of light from the light source assemblies reflected from a surface of the wheel is greater than an amount of light from the light source assemblies directed away from the surface of the wheel.

52. The system of claim 51 wherein at least one of the light source assemblies is shielded such that the amount of light from the light source assemblies directed away from the surface of the wheel, that is incident in a specified observation region, is reduced.

53. The system of claim 51 wherein at least one of the light source assemblies includes a corresponding shield attached thereto, at least one of the shields having a reflective surface

facing a light source of the attached light source assembly such that a portion of a light reflected from the reflective surface is incident upon the wheel surface.

54. The system of claim 51 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more light projectors.

55. The system of claim 51 wherein the light source assemblies are discrete assemblies.

56. The system of claim 51 wherein a portion of light from at least one of the light source assemblies is directed to the surface of the wheel through one or more optical elements.

57. The system of claim 51 wherein the light source assemblies are mounted on a structure attached to at least a portion of a rim of the wheel.

58. The system of claim 57 wherein the structure is an annular ring attached to a rim flange of the wheel.

59. The system of claim 51 wherein the light source assemblies are mounted on a wheel center cap affixed to the wheel.

60. The system of claim 51 wherein the light source assemblies are mounted on a crossbeam member.

61. The system of claim 60 wherein the crossbeam member extends across a diameter of a rim of the wheel.

62. The system of claim 51 wherein at least one of the light source assemblies includes a waveguide such that a portion of light from the at least one of the light source assemblies is coupled to the waveguide and directed from the waveguide to the surface of the wheel.

63. The system of claim 62 wherein a mechanism for coupling the portion of the light to the surface of the wheel includes a micro-optic prism array sheet collimator layer.